CLAIMS

1. A high-resistance silicon wafer having resistivity of 100 Ωcm or more, wherein a carbon concentration is 5×10^{15} to 5×10^{17} atoms/cm^3.

2. The high-resistance silicon wafer according to claim 1, wherein an oxygen concentration in the wafer is beyond 8×10^{17} atoms/cm^3 (Old-ASTM).

3. The high-resistance silicon wafer according to claim 1 or 2, wherein a DZ (Denuded Zone) layer is formed at least 5 μm or more in depth from a surface of the wafer.

4. The high-resistance silicon wafer according to any one of claims 1 to 3, wherein a density of a LPD (Light Point Defect) having a size of 0.12 μm or more and observed on a surface of the wafer is controlled so as to be 0.2/cm^2 or less.

5. An epitaxial wafer having a high-resistance silicon wafer according to any one of claims 1 to 4 as a base wafer.

6. An SOI wafer having a high-resistance silicon wafer according to any one of claims 1 to 5 as a base wafer.

7. The SOI wafer according to claim 6, which is a bonded wafer or a

SIMOX wafer.

8. A method of manufacturing a high-resistance silicon wafer, characterized in that a heat treatment which is effective in preventing an oxygen donor from being generated is performed on a silicon wafer having a resistivity of 100 Ωcm or more and a carbon concentration of 5×10^{15} to 5×10^{17} atoms/cm^3.

9. The method of manufacturing a high-resistance silicon wafer according to claim 8, wherein a remaining oxygen concentration after the heat treatment is 6.5×10^{17} atoms/cm^3 (Old-ASTM) or more.

10. The method of manufacturing a high-resistance silicon wafer according to claim 8, wherein the heat treatment is a high-temperature heat treatment at 1100°C or higher.

11. The method of manufacturing a high-resistance silicon wafer according to claim 8, wherein the heat treatment is an oxygen out-diffusion treatment for forming a DZ (Denuated Zone) layer on a wafer surface.

12. The method of manufacturing a high-resistance silicon wafer according to claim 11, characterized in that after the oxygen out-diffusion treatment, a heat treatment for forming an oxygen precipitate nucleus, or the heat treatment for forming the oxygen precipitate nucleus and a heat treatment for growing an oxygen precipitate are performed.

13. The method of manufacturing a high-resistance silicon wafer according to claim 8, wherein the heat treatment is high-temperature annealing treatment for eliminating a COP which is a void defect caused by a hole from a wafer surface.

14. A method of manufacturing an SOI wafer, characterized by manufacturing an SIMOX type of SOI wafer comprising a high-resistance silicon wafer having resistivity of 100 Ωcm or more and a carbon concentration of 5×10^{15} to 5×10^{17} atoms/cm^3 as a base wafer.

15. The method of manufacturing an SOI wafer according to claim 14, wherein a high-temperature heat treatment for forming a BOX layer in a SIMOX type of SOI wafer manufacturing process serves also as a heat treatment which is effective in preventing generation of an oxygen donor.

16. A method of manufacturing an SOI wafer, characterized by manufacturing a bonded type of SOI wafer comprising a high-resistance silicon wafer having resistivity of 100 Ωcm or more and a carbon concentration of 5×10^{15} to 5×10^{17} atoms/cm^3 as a base wafer.

17. The method of manufacturing the SOI wafer according to claim 16, wherein the high-temperature heat treatment performed in the bonded type of SOI wafer manufacturing process serves also as a heat treatment which is effective in preventing the generation of the oxygen donor.